



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/599,144

09/21/2006

Miha Fuderer

PHNL040346US

4947

38107

7590

05/14/2008

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
595 MINER ROAD
CLEVELAND, OH 44143

EXAMINER

FETZNER, TIFFANY A

ART UNIT

PAPER NUMBER

2831

MAIL DATE

DELIVERY MODE

05/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/599,144 | Applicant(s) FUDERER ET AL. | |
| | Examiner Tiffany A. Fetzner | Art Unit 2831 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED Non-final ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement(s) (IDS)'s submitted on **9/21/2006** is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement. The initialed and dated information disclosure statement(s) (IDS)'s submitted on **9/21/2006** is attached to this Office action.

Specification

3. The **title** of the invention is **not descriptive**. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: **---MRI system where a sheet placed in the vicinity of an imaged subject within the MRI system makes the Total Conductance Isotropic---**

Drawings

4. The drawings objections From the November 20th 2007 Office action are rescinded in view of the corrections made to the specification in the Feb. 15th 2008 amendment and response.

Claim Objections

5. **Claim1** is objected to because of the following informalities:

A) In **claim 1** the MRI system is not actively / positively recited and constitutes an intended use issue, therefore the magnetic resonance imaging of claim 1 is not considered to have patentable weight. Appropriate correction is required. The examiner suggests changing the words "A system for" to "A system **of**" in order to give the MRI system patentable weight. The examiner also notes that the only type of system disclosed in applicant's disclosure is an MRI system, so correction is needed to ensure that the claims are commensurate in scope with the scope of the invention originally disclosed within the specification.

B) In **claim 1** in **line 5** delete “can be’ and insert ‘is” in order to remove the vague and indefinite issue of whether or not " a subject within a cavity **is** or **is not** at aspect of applicant’s claims.

Response to Arguments

6. Applicant's arguments with respect to **Amended claims 1-13** and **newly added claims 14-20** have been considered but are moot in view of the new ground(s) of rejection. The newly set forth objections to claim 1, because of the intended use issues and the indefinite listing of elements make this office action Non-final.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Amended Claims 1-7, and 11-12 are** rejected under **35 U.S.C. 102(b)** as being anticipated by **Segawa** US patent **5,865,177** issued February 2nd 1999.

9. With respect to Amended **Claim 1**, **Segawa** teaches and shows "A system for magnetic resonance imaging" [See abstract, col. 2 lines 51-67] , “comprising: a substantially cylindrical cavity” [See figures 1 through 7 and figures 12 through 15] “wherein the cavity has an axis of symmetry in the direction of a z-axis;” [See figure 1] “wherein a subject can be examined within the cavity;” [See figure 12, figures 2a, 2b, and 4; col. 2 lines 51-67; col. 3 lines 13-16, col. 3 lines 19-23, col. 4 line 1 through col. 5 line 11; col. 5 lines 38-48, col. 8 line 28 through col. 10 line 29, where the applicant’s claimed “subject” is interpreted as the “biological body” of the **Segawa** reference.] “wherein the subject” (i.e. the biological body) “has a conductance which is not isotropic in an xy-plane which is perpendicular to the z-axis;” [See col. 9 lines 1-14 as one example of this teaching.] “wherein an electrically conductive material” (i.e. such as the copper film which **Segawa** teaches was originally presented by Foo et al., [See col. 8 lines 49-57 and col. 8 lines 20-26 where the full Foo et al., citation is taught by **Segawa**]), or the aqueous high-molecular gel sheet of **Segawa** specifically which has a

dielectric constant greater than 30, a magnetic susceptibility within approximately 150% of the biological body being examined, a high permittivity and a high conductivity. [See col. 10 lines 5-28; col. 8 line 6 through col. 9 line 20; col. 4 lines 1-67; col. 2 line 51 through col. 3 line 4. the examiner notes that since conductivity is the inverse of resistivity that **Segawa** implicitly teaches a low resistivity for the copper foil which is originally used in prior art methods or the aqueous high-molecular gel sheet, specifically taught by **Segawa**.] “is placed within the cavity” [See figures 5, 6, 7, 12, 13, 14, 15; col. 4 lines 1-67; col. 2 line 51 through col. 3 line 4] “wherein the material has a conductivity and a thickness which render the total conductance in the xy-plane within the cavity to be isotropic” [See col. 8 line 28 through col. 10 line 29]

10. With respect to Amended **Claim 2**, **Segawa** teaches and shows “wherein the system is a magnetic resonance imaging apparatus or a radio frequency (RF) coil for magnetic resonance imaging.” [See col. 2 lines 51-67, figures 5 through 15; and the abstract, as some examples of these features.] “and wherein improving isotropicity of the conductance improves homogeneity of the RF fields.” [See col. 4 lines 11-67; col. 5 lines 19-52; the Theoretical analysis of col. 5 line 54 through col. 8 line 4; and the explanation of col. 8 line 11 through col. 10 line 29; with **figures 8, 9, and 16a through 16ae**.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 2** and need not be reiterated.

11. With respect to Amended **Claim 3**, **Segawa** teaches and shows from figures 5, 6, 7, 13, 14, and 15 that “~~at least a part of~~ the material (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56]) “is includes a strip attached to an upper inner wall of the cylindrical cavity and not along side walls of the cylindrical cavity” [See figure 13]. The same reasons for rejection, which apply to **claims 1, 2**, also apply to **claim 3** and need not be reiterated.

12. With respect to Amended **Claim 4**, **Segawa** teaches and shows from figures 5, 6, 7, and 13 that “at least a part of the material (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56]) “is attached to a bottom of a substantially planar surface on which the subject can

be positioned.” [See figures 5, 6, 7, and 13] The same reasons for rejection, which apply to **claim 1** also apply to **claim 4** and need not be reiterated.

13. With respect to Amended **Claim 5**, **Segawa** shows that the “substantially planar surface” (i.e. See figures 3, 5, 6, and 7) “is part of a patient's bed” [See f See col. 2 lines 51-67, col. 4 lines 1-67; col. 5 lines 38-52] The same reasons for rejection, which apply to **claims 1, 4**, also apply to **claim 5** and need not be reiterated.

14. With respect to Amended **Claim 6**, **Segawa** teaches that the electrically conductive material is removably attached within the cavity.” [See col. 4 lines 1-67; col. 9 line 54 through col. 10 line 28.] The same reasons for rejection, which apply to **claims 1, 2, 3** also apply to **claim 6** and need not be reiterated.

15. With respect to Amended **Claim 7**, **Segawa** shows that the “material ~~is substantially extends along and above and or below a substantially plane~~ surface on which the subject ~~can be positioned~~ is supported in the cavity” [See figures 5, 6, 7, 13, and 14 in combination with one another.] The same reasons for rejection, which apply to **claim 1** also apply to **claim 7** and need not be reiterated.

16. With respect to Amended **Claim 11**, **Segawa** teaches that the material is a sheet being covered by a conductive layer (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56, col. 8 line 28 through col. 10 lines 5-22]). The same reasons for rejection, which apply to **claim 1** also apply to **claim 11** and need not be reiterated.

17. With respect to Amended **Claim 12**, **Segawa** teaches from col. 10 lines 5-9 that only predetermined parts of the sheet are covered by a conductive layer (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56, col. 10 lines 5-9]). The same reasons for rejection, which apply to **claims 1, 11** also apply to **claim 12** and need not be reiterated.

18. With respect to Amended **Claim 14**, **Segawa** teaches “A magnetic resonance imaging system comprising: an examination region which receives a region of a subject to be imaged, which subject has an asymmetry in conductance in a cross sectional plane due to a first cross sectional dimension that is greater than a second cross sectional dimension;” [See abstract, col. 2 lines 1-67; col. 8 line 12 through col. 10 line

28] “an RF coil assembly for generating RF excitation (B1) fields, the asymmetry in the conductance of the imaged subject causing an inhomogeneity in the generated RF excitation (B1) fields;” [See col. 7 line 46 through col. 10 line 28; col. 1 line 19 through col. 2 line 67] “an electrically conductive material disposed along the second cross sectional dimension”, [See col. 2 lines 46-67; figures 8, 9; col. 7 line 5 through col. 10 line 28] “the electrically conductive material having an electrical conductivity which renders the conductance of the subject more symmetric reducing the inhomogeneity in the RF excitation (B1) fields.” [See abstract, col. 2 line 46 through col. 3 line 4; col. 7 line 46 through col. 10 line 28].

19. With respect to New **Claim 15**, **Segawa** teaches and shows “wherein the second dimension is generally vertical” [See figures 8, 9, 11, 12, 13, 5, 6, 7; col. 2 lines 51-67; col. 7 line 3 through col 10 line 28] “and the conductive material includes a conductive sheet which is placed on or under the subject.” [See abstract, col. 4 lines 1-67; col. 2 lines 51-67; col. 7 line 3 through col 10 line 28, figures 5, 6, 7]. The same reasons for rejection, which apply to **claim 14** also apply to **claim 15** and need not be reiterated.

20. With respect to New **Claim 16**, **Segawa** teaches and implies “wherein the conductive sheet includes a carbon coating” because organic compounds are comprised of carbon chains linked to other organic molecules, and the “coating” of **Segawa** which is part of the aqueous material includes a carbon based coating of poly acryl resin (PAR) or poly vinyl alcohol (PVA). [See col. 4 lines 46-56 as one example] The same reasons for rejection, which apply to **claims 14, 15** also apply to **claim 16** and need not be reiterated.

21. With respect to New **Claim 17**, **Segawa** teaches and shows wherein the conductive material (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56]) “includes an electrically conductive strip mounted at least one of over and under the subject but not along sides of the subject. [See figure 13]. The same reasons for rejection, which apply to **claim 14** also apply to **claim 17** and need not be reiterated.

22. With respect to New **Claim 18**, **Segawa** teaches and shows “A method of improving RF field homogeneity in magnetic resonance imaging”, [See col. 4 lines 11-

67; col. 5 lines 19-52; the Theoretical analysis of col. 5 line 54 through col. 8 line 4; and the explanation of col. 8 line 11 through col. 10 line 29; with **figures 8, 9, and 16a** through **16ae**.] “the method comprising: placing a strip of electrically conductive material” (i.e. the aqueous high-molecular gel sheet which may comprise poly acryl resin PAR or poly vinyl alcohol PVA [See col. 4 lines 46-56]) “along a subject such that a conductance of the subject in a transverse plane is made more isotropic;” [See the explanation of col. 7 line 3 through col. 10 line 28] “performing a magnetic resonance imaging sequence on the subject and the strip.” [See the abstract, and figures 5, 6, 7, 12, 13, and 14 in combination with one another.]

23. With respect to New **Claim 19**, **Segawa** shows wherein the subject is larger in a transverse width dimension than a transverse height dimension” {See figures 12, 13, 14, 7], “the method further including: removably laying a strip along at least one of an upper and lower surface of the subject, and not along sides of the subject.” [See figure 13, col. 5 lines 35-53, and col. 10 lines 5-9 as some examples of this limitation.] The same reasons for rejection, which apply to **claim 18** also apply to **claim 19** and need not be reiterated.

24. With respect to New **Claim 20**, **Segawa** teaches and shows “wherein the subject when positioned for the magnetic resonance imaging sequence has a vertical dimension which is less than a horizontal dimension,” [See figures 12, 13, 14] “the method further including: mounting the strip of electrically conductive material to MRI hardware at least one of above and below the subject and not along sides of the subject. [See figures 13, 14, col. 5 lines 35-53, and col. 10 lines 5-9 as some examples of this limitation.] The same reasons for rejection, which apply to **claim 18** also apply to **claim 20** and need not be reiterated.

Claim Rejections - 35 USC § 103

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

Art Unit: 2831

to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

27. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

28. **Amended Claims 8-10, and 13 are** rejected under **35 U.S.C. 103(a)** as being unpatentable over **Segawa** US patent **5,865,177** issued February 2nd 1999.

29. With respect to Amended **Claims 8-10**, **Segawa** lacks directly teaching that "that the material (i.e. the aqueous high molecular gel sheet taught in the abstract and throughout the reference) has a planar resistance between about: "5 **ohms** and about 20 **ohms** (i.e. **claim 8**) "the material (i.e. the aqueous high molecular gel sheet taught in the abstract and throughout the reference) is above the subject and has a planar resistance between about 5 **ohms** and about 10 **ohms** (i.e. **claim 9**), or that "the material is below the subject and has a planar resistance between about 12 **ohms** and about 16 **ohms** " (i.e. **claim 10**), because **Segawa** lacks directly teaching the specific ranges of the aqueous high molecular gel sheet taught in the abstract and throughout the reference) However, because conductivity is the inverse of resistivity and because the conductivity and permittivity are taught to be high, it would have been obvious to

one of ordinary skill in the art at the time that the invention was made to use any range of planar resistance for the aqueous high molecular gel sheet taught in the abstract and throughout the reference which was necessary according to the computer calculations to distribute the homogeneity of the magnetic field in a manner which results in the magnetic field strength becoming more homogeneous (i.e. this also intrinsically results in the patients' conductivity becoming more isotropic across the cavity, since the patients' presence is no longer causing variations in the magnetic field), as taught from col. 7 line 3 through col. 10 line 28 in detail. Therefore the applicant's ranges of planar resistance, would have been obvious to try given the optimized flexible aqueous high molecular gel sheet taught in the abstract and throughout the reference, and therefore the ranges themselves are not a novel or nonobvious advancement over the know prior art of **Segawa**. The same reasons for rejection, which apply to **claims 1, 7** also apply to **claims 8-10** and need not be reiterated.

30. With respect to Amended **Claims 13**, **Segawa** lacks directly teaching that the MRI system "is arranged to operate with magnetic fields at or above 3 Tesla." Because at the time of the filing of the **Segawa** reference, the strongest magnetic field currently being utilized in 1996, 12 years ago was a 1.5 strength Tesla Magnetic field. The examiner notes that in **Segawa** there is a noted typographical error that occurs multiple times, which is that the word Tesla has been misspelled as "Telsa" is a clear typographical error since the definition for this unit cited by **Segawa** is the conventional definition of the "Tesla" magnetic field measurement. Additionally, **Segawa** teaches that nonuniformity of the static magnetic field becomes more noticeable as the static magnetic field becomes greater and the Larmor frequency becomes higher. The ability to control the wavelength of the body or the high frequency RF magnetic field around the body in order to make it longer, results in the nonuniformity being suppressed in the event that the magnitude of the static magnetic field becomes great, (i.e. increases to a level greater than the taught 1.5 Tesla magnetic field strength.). [See col. 8 lines 11-19, col. 9 lines 15-21, and the explanation of col. 9 line 1 through col. 10 line 28 in combination with these teachings.] These teachings imply, that at 1.5T and above a means to compensate for magnetic non-uniformity caused by the subject being added

Art Unit: 2831

into the scanner must be accounted for, therefore it would have been obvious to one of ordinary skill in the art at the time that the invention was made that the teaching and scope of **Segawa** is relevant to MRI devices of High magnetic field strength which is interpreted by the examiner as being 1.5Tesla or higher, which would include applicant's specified range of 3Tesla because "high magnetic field strength" is a relative term of degree, and in 1996 1.5Tesla was a "high magnetic field strength" and **Segawa** taught the necessity of accounting for the non-uniformity issue in case the Static magnetic field strength was increased. As a result of this it would have been readily apparent to one of ordinary skill in the art at the time that the invention was made that applicant's limitation of having a 3Tesla static magnetic field is simply the readily obvious verification, of a feature already taught and suggested by the **Segawa** reference, for those situations where technology improves to the point of being able to produce stronger static magnetic fields in MRI systems beyond the 1.5 Tesla magnetic field strength that was conventional in 1996. The same reasons for rejection, which apply to **claim 1** also apply to **claim 13** and need not be reiterated.

Prior Art of Record

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) Jesmanowicz et al., US patent **6,294,972 B1** issued September 25th 2001.

Conclusion

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday, Wednesday, and Friday-Thursday from 7:00am to 2:10 pm., and on Tuesday and Thursday from 7:00am to 5:30pm.

33. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Diego Gutierrez**, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

34. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status

Art Unit: 2831

information for unpublished applications is available through Private PMR only. For more information about the PMR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Diego Gutierrez/
Supervisory Patent Examiner, Art Unit 2831

/TAF/
May 16, 2008